

Heavy Rail Vehicle Procurement Orange Line and Red Line

Stephens Hicks

Chief Mechanical Officer

Massachusetts Bay Transportation Authority



2018 Rail Conference

MBTA Heavy Rail Vehicle Procurement

Project Summary

- Carbuilder – CRRC MA, formerly CNR
 - 152 Orange Line Cars
 - 252 Red Line Cars
- Orange Line Expected Revenue Service – Fall 2018
- Red Line Expected Revenue Service – Fall 2019



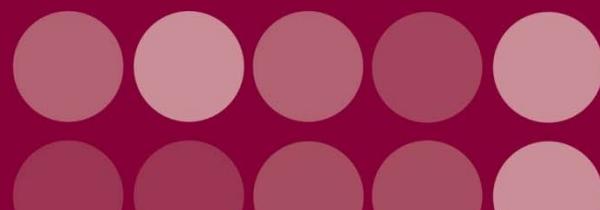
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MBTA Heavy Rail Vehicle Procurement

Orange Line Pilot Cars



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Project Goals

- Replace Orange Line #12 Fleet and Red Line #1 and #2 Fleets
 - #12 Fleet – 1979 – 1981
 - #1 Fleet – 1969 – 1970
 - #2 Fleet - 1988
- Subsequent Contract Amendment added 120 Red Line Cars to replace the #3 Fleet
 - #3 Fleet – 1993 - 1994



Project Justification

- Orange Line Fleet
 - End of expected service life
 - Necessary Carbody Repairs
 - No mid-life Overhaul
- Red Line Fleets
 - #1 – Beyond expected Service Life
 - #2 – End of expected service life
 - #3 – Standardization of Fleet and cost/benefit “New vs. Overhaul”



Specification Development

- Concept Report
- Specification Development
- Reviews at each phase
 - Stake Holder
 - Industry Review



Design Highlights

- Accessibility
 - 4 Accessible Locations
 - Wider Doors (64 in, each leaf 32 in)
 - Gap Mitigation Device
 - Audio (PA), Visual (LED) and PEI (6 locations)
- Functionality
 - ASME RT-2 2014 Compliance
 - Remote Diagnostics
 - LED Lighting (APTA-RT-S-VIM-020-10)
 - LLEPM (APTA-RT-S-VIM-022-10)
 - CCTV / Video Recording
 - LCD Monitors (6/8)



Evaluation Process

- Sequestered Evaluation Team
- All affected MBTA Departments Represented
- Consultant Support
 - Procurement Management Team
 - Technical Consultant
 - Financial Capability Consultant
 - Technical Peer Consultants



Design Process

- Collaborative Design Process
 - PDR
 - IDR
 - FDR
- Local and Remote Meetings
- Informal (Interim) Parallel Reviews
- Active Involvement of Stakeholders
 - Team Oriented Approach



APTA Standards

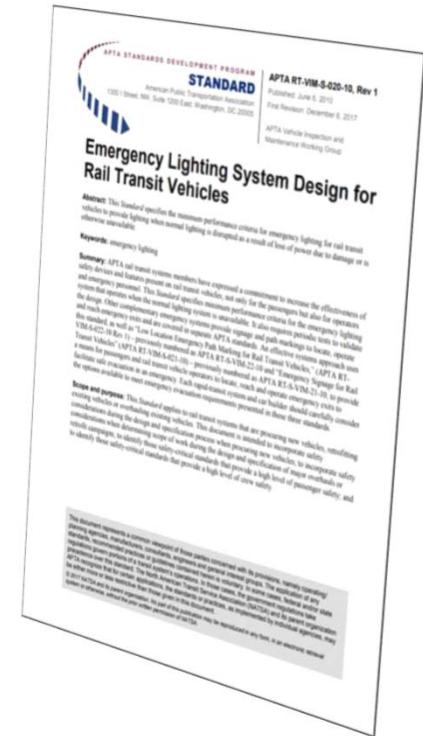


- 18 Different APTA Standards & Recommended Practices (RPs) were cited in the procurement
 - 2 Electrical Standards, 5 Electrical RPs
 - 4 Rail Transit Systems Standards
 - 5 Construction & Structural Standards
 - 2 Mechanical Standards
 - 1 Passenger Systems Standard



Standards In Action

- *APTA's Rail Transit Emergency Systems Standard Suite*
- 4 standards (now 5) that describe industry-consensus requirements for various aspects of Rail Transit Vehicle Emergency Systems
- Subjects covered include Emergency Lighting, Emergency Signage, Low-Location Emergency Path Markings, and Emergency Egress/Access



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Orange Line Mock-Up



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Laser Welded Skin

- Aesthetically Pleasing
- Stainless Steel (PR-CS-S-004-98)
- Collaborative Structural Review with CRRC and their consultants



ASME RT-2 Compliance

- Minimum strength requirements for coupler pockets, collision & corner posts, and buff load
- Now requires the builder understand how the trainset behaves through two specific collision scenarios. The areas of interest for the scenarios are vehicle deceleration rate, operator & passenger space, and remaining on the rail.
- Requires a minimum series of tests be performed to validate the vehicles strength.

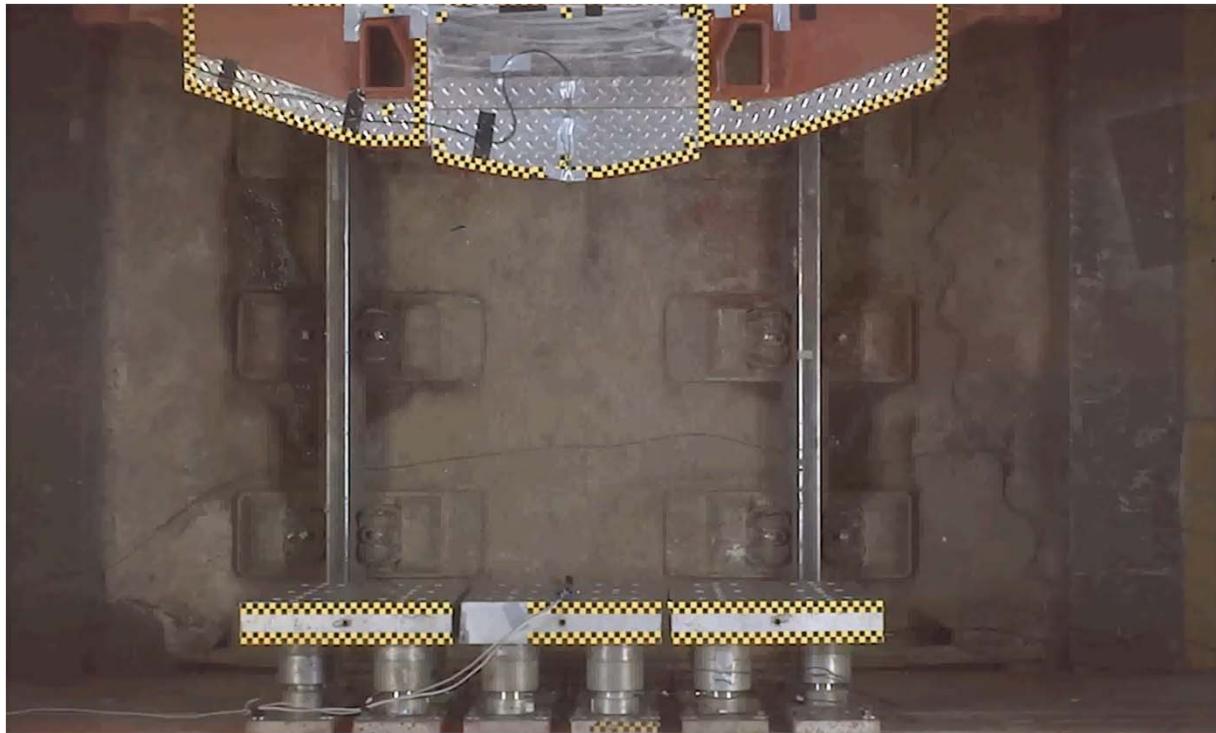


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ASME RT-2 Compliance



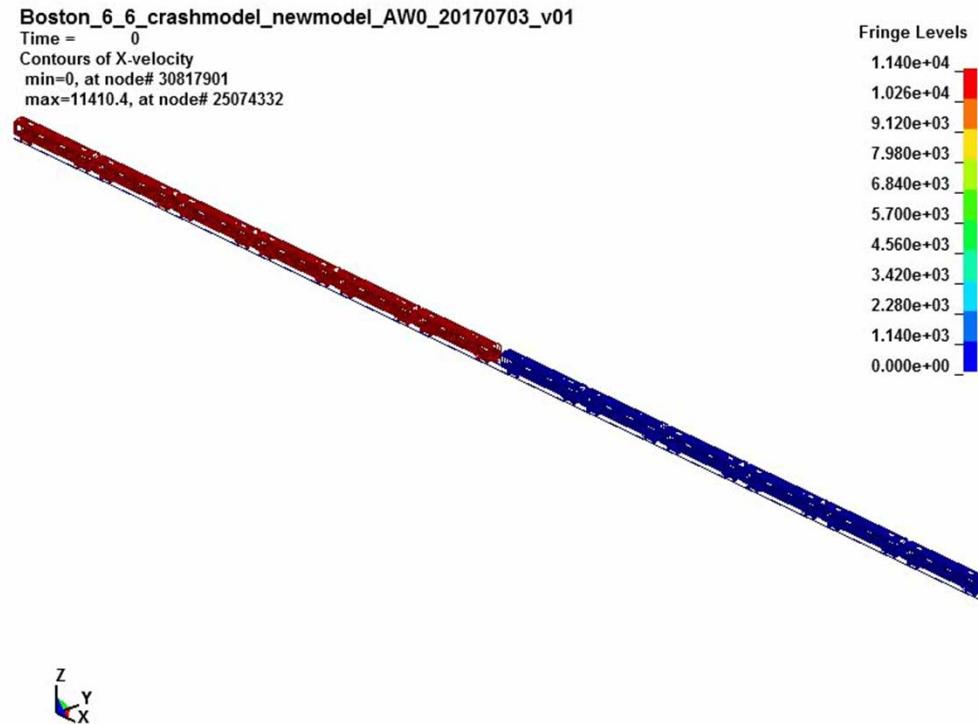
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ASME RT-2 Compliance

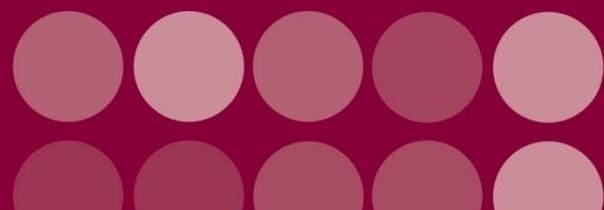


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Red Line Mock-Up



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Passenger Information Screens

- Screen size, quantity and locations revised during Orange Line Mock-Up review
- 24" LCD Monitors
- 6 / 8 screens on the Orange and Red Line cars
- On-Board Controller with ability to push messages from Wayside.



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Current Status

- Orange Line
 - Four Pilot Cars in test in Boston
 - Four Pilot Cars in test in Changchun
 - Four Production Cars in Final Assembly in Springfield, MA (December 2018 delivery)
- Red Line
 - Mock-Up constructed and inspected in Changchun (arrives in Boston in July)
 - Structural Test Shell Under Construction



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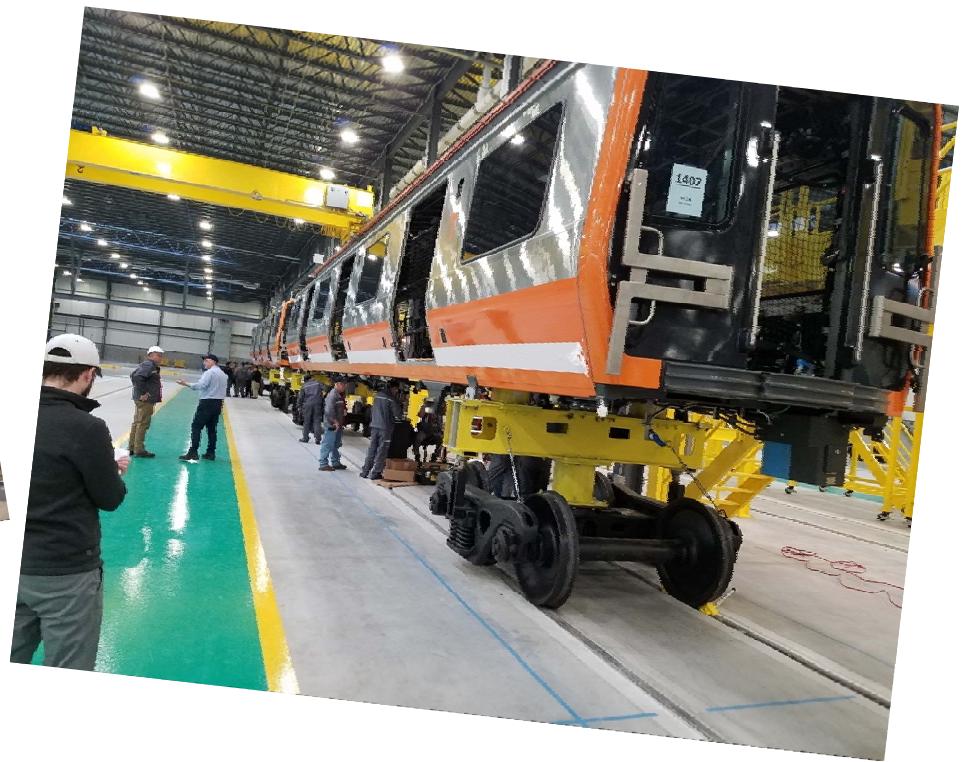
Final Assembly Facility

- 100% State Funding allowed a Massachusetts Final Assembly Requirement
- CRRC MA designed and constructed a 204,000 square foot facility with a 2,240 foot dynamic test track in Springfield Massachusetts.
- Currently, 86 employees at the Springfield Facility, with a goal of 150 at full occupancy
- The facility will assemble not only MBTA vehicles, but vehicles for LA METRO and SEPTA

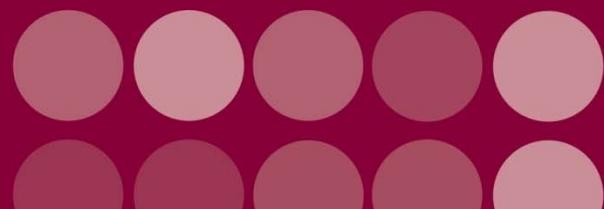


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Final Assembly Facility



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Orange Line Pilot Car



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Thank You



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